California Regional Water Quality Control Board
North Coast Region

MONITORING AND REPORTING PROGRAM NO. R1-2004-0036

FOR

CITY OF ARCATA
MUNICIPAL WASTEWATER TREATMENT FACILITY

Humboldt County

The purpose of the Monitoring and Reporting Program is to demonstrate compliance with the effluent limitations, specifications, and other provisions contained within the City of Arcata's (hereinafter "Permittee") NPDES permit. Where composite samples are required, they may be taken by a flow-proportional sampling device approved by the Executive Officer of the Regional Water Board or by grab samples composited in proportion to flow. When compositing grab samples, the sampling interval shall not exceed one hour. Following are the requirements of the Monitoring and Reporting Program.

INFLUENT MONITORING

Influent samples shall be collected at any point in the facility headworks, preceding treatment, at which all wastewater flowing into the WWTF is present. Representative influent wastewater samples shall be collected and analyzed as follows.

Constituent	Units	Type of Sample	Frequency
Mean and Peak Daily Flow	mgd	metered	continuous
BOD_5	mg/L	24-hour composite	weekly
Suspended Solids	mg/L	24-hour composite	weekly

EFFLUENT MONITORING – OUTFALL NO. 001

Samples shall be collected of disinfected and dechlorinated effluent prior to discharge from Outfall No. 001.

Constituent	Units	Type of Sample	Frequency
Mean and Peak Daily Flow	mgd	metered	continuous
BOD_5	mg/L	24-hour composite	weekly
Suspended Solids	mg/L	24-hour composite	weekly
Settleable Solids	ml/L	grab	daily
pH	standard units	grab	daily
Chlorine Residual[3]	mg/L	continuous	continuous
Chlorine Residual[4]	mg/L	continuous	continuous

[3] Immediately prior to dechlorination.
[4] After dechlorination

Constituent	Units	Type of Sample	Frequency
Fecal Coliform	MPN/100ml	grab	no less than 5 per month not more than 7 days apart
Grease and Oil	mg/L	grab	quarterly
Copper	µg/L	grab	quarterly
Zinc	µg/L	24-hour composite	quarterly
Cyanide	µg/L	24-hour composite	quarterly
2,3,7,8-TCDD TEQ	pg/L	24-hour composite	quarterly
Acute Toxicity[3ɔ]	TUa	grab	quarterly
Chronic Toxicity[3]	TUc	grab	quarterly

EFFLUENT MONITORING – OUTFALL NO. 002

Samples shall be collected of secondary treated effluent prior to discharge from Outfall No. 002.

Constituent	Units	Type of Sample	Frequency
Flow	mgd	metered	continuous
BOD_5	mg/L	24-hour composite	weekly
Suspended Solids	mg/L	24-hour composite	weekly
Settleable Solids	ml/L	grab	daily
pH	standard units	grab	daily
Total Coliform	MPN/100ml	grab	no less than 5 per month not more than 7 days apart
Grease and Oil	mg/L	grab	quarterly

EFFLUENT MONITORING – PRIORITY POLLUTANTS

Priority Toxic Pollutants listed in the California Toxics Rule [40 CFR Part 131.38(b)(1)] shall be monitored in Discharge Serial No. 001 annually with results being reported in annual reports, beginning with the annual report due by February 28, 2005. Volatile and semi-volatile constituents shall be analyzed in grab samples collected at appropriate times and intervals, and the remaining constituents shall be analyzed in 24-hour composite samples collected at one hour intervals. Samples shall be collected during the dry season, and results shall be submitted as part of the permit renewal application. Laboratories analyzing these samples shall be certified by the Department of Health Services, in accordance with the provisions of Section 13176 of the California Water Code, and must include quality assurance/quality control data with their analytical reports.

[ɔ] Test procedures for acute and chronic toxicity shall adhere to methods described by this Monitoring and Reporting program.

1. Priority Pollutant Analytical and Reporting Requirements

   Priority pollutants shall be analyzed by methods specified in 40 CFR 136 or Standard Methods for the Examination of Water and Wastewater and further specified in the State Water Resources Control Board's *Policy for Implementation of Toxics Standards for Inland Surface waters, Enclosed Bays, and Estuaries of California* (State Implementation Plan or SIP). Any other test protocols must be approved by the Executive Officer prior to use. All data must be reported uncensored with the method detection limits and either practical quantitation levels (PQLs) or Limits of quantitation (LOQs). Only data from certified laboratories will be accepted.

   Aquatic Life water quality objectives for cadmium, chromium, copper, lead, nickel, silver and zinc are based on the acid soluble fraction. Compliance with these objectives shall be determined using the total recoverable method or a method approved by the State Board's Executive Officer.

   The Permittee shall use the Minimum Level, corresponding to the method used for analysis, for reporting and compliance determination. Minimum Levels are found in the SIP.

   Minimum Levels represent the lowest quantifiable concentration in a sample based on the proper application of method specific analytical procedures and the absence of matrix interferences. Minimum Levels also represent the lowest standard concentration in the calibration curve for a specific analytical technique after the application of appropriate method specific factors. Common analytical practices may require different treatment of the sample relative to the calibration standard.

   The Permittee shall instruct its laboratory to establish calibration standards so that the Minimum Level (or its equivalent, if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. The Permittee shall not use analytical data derived from extrapolation beyond the lowest point of the calibration curve. The Permittee's laboratory may employ a calibration standard lower than the Minimum Level appearing herein only in accordance with the discussion above.

2. Priority Pollutant Reporting Protocols

   a. The Permittee must report with each sample result the Minimum Level that corresponds to the analytical method employed, and the laboratory's current MDL.

   b. The Permittee must also report the results of analytical determinations for the presence of chemical constituents in a sample using the following protocols:

      i. Sample results greater than or equal to the reported Minimum Level must be reported "as measured" by the laboratory (i.e., the measured chemical concentration in the sample);

ii. Sample results less than the reported Minimum Level, but greater than or equal to the laboratory's MDL, must be reported as "detected, but not quantified" or DNQ. The laboratory must write the estimated chemical concentration of the sample next to DNQ, as well as the words "estimated concentration," which may be shortened to "est. conc."; and

iii. Sample results less than the laboratory's MDL must be reported as "not detected" or ND.

Compliance Determination

Compliance with effluent limitations shall be determined as follows:

1. Permittee shall be deemed out of compliance with an effluent limitation if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported ML.

2. Permittee shall be required to conduct a Pollutant Minimization Program (PMP) in accordance with the SIP when there is evidence (e.g. sample results reported as DNQ when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods included in the permit in accordance with sections 2.4.2 or 2.4.3 of the SIP, presence of whole effluent toxicity, health advisories for fish consumption, results of benthic or aquatic organism tissue sampling) that the priority pollutant is present in the effluent above an effluent limitation and either:

   a. A sample result is reported as DNQ and the effluent limitation is less than the reported ML; or
   b. A sample result is reported as ND and the effluent limitation is less than the MDL.

The RWQCB may include special provisions in the permit to require the gathering of evidence to determine whether the constituent of concern is present in the effluent at levels above a calculated effluent limitation.

When determining compliance with an AMEL and more than one sample result is available in a month, the Permittee shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the Permittee shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, reported as ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data

points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

If a sample result, or the arithmetic mean or median of multiple sample results, is below the reported ML, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the Permittee conducts a PMP in accordance with the SIP, the Permittee shall not be deemed out of compliance.

RECEIVING WATER MONITORING

The Permittee shall submit a receiving water monitoring plan not later than December 31, 2004. The Executive Officer may revise this Monitoring and Reporting Program after receipt of the plan to require monitoring for compliance with Basin Plan receiving water objectives and to reduce monitoring for any constituents where data indicates no reasonable potential to exceed effluent or receiving water limitations.

SOLIDS DISPOSAL MONITORING

Monthly, describe the quantity of sludge discharged to the sludge drying beds and its ultimate disposition. Monthly, describe the approximate quantity and disposition of other solid wastes generated as part of the treatment process.

STORM WATER MONITORING

Visual observations shall be performed to verify that storm water generated within the Corporation yard and sewage treatment plant areas does not discharge directly to Arcata Bay or its tributaries. Once each year, prior to the storm season, the condition of all storm drains shall be evaluated to determine if all storm water will be captured and routed to the treatment plant and disposal system. Any needed corrective action that is discovered during the dry season evaluation shall be performed prior to the first storm event. All results shall be reported in the regular monthly monitoring report.

ANALYTICAL METHODS

Unless described otherwise herein, suitable analytical methods are those specified at 40 CFR 136 and are the most recently approved that appear in *Standard Methods for the Examination of Water and Wastewater*. Any other protocols must be approved by the Executive Officer prior to use. Analytical methods for copper and zinc must achieve Minimum Levels, as defined by the SIP, that are established in Appendix 4 of the SIP and that are lower than their effluent limitations established by WDRs Order No. R1-2004-0036. The analytical method for cyanide must achieve the Minimum Level as established by Appendix 4 of the SIP. Analysis for 2, 3, 7, 8-TCDD shall be by U.S. EPA Method 1613.

Analytical data reports for priority pollutants shall be reported uncensored and shall identify method detection limits, based on the procedure found in 40 CFR 136, and shall identify the applicable Minimum Level from Appendix 4 of the SIP.

Laboratories must be certified by the Department of Health Services, in accordance with the provisions of Section 13176 of the California Water Code, and must submit quality assurance/quality control data with their analytical reports.

EFFLUENT ACUTE TOXICITY MONITORING

1. Sampling: The Permittee shall collect quarterly grab samples of treated effluent discharged to Outfall No. 001 for acute toxicity testing as indicated below. For toxicity tests requiring renewals, grab samples collected on consecutive days are required.

2. Test Species: The Permittee shall conduct 96-hour static renewal tests with Rainbow Trout, oncorhynchus mykiss.

3. Methodology: Sample collection, handling and preservation shall be in accordance with EPA protocols. The presence of acute toxicity shall be estimated as specified in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (U.S. EPA Report No. EPA 600/4-90-027F, 4th edition or subsequent editions), or other methods approved by the Executive Officer. A concurrent reference toxicant test shall be performed for each test.

4. Dilution Series: Where the LC50 is calculated, the Permittee shall conduct tests of effluent at 100 percent, 75 percent, 50 percent, 25 percent, and 12.5 percent of its initial strength. Dilution and control waters shall be obtained from an area unaffected by the discharge in the receiving waters. Standard dilution water may be used if the above sources exhibit toxicity or if approved by the Executive Officer. Where the t-test is used instead of the LC50, the Permittee shall conduct tests using 100 percent effluent and a control.

5. Accelerated Monitoring: If the result of any single acute toxicity test does not comply with the acute toxicity effluent limitation, the Permittee shall take two more samples, one within 14 days, and one within 21 days of receiving the sample results. If two of the three samples do not comply with the acute toxicity limitation, the Permittee shall initiate a Toxicity Reduction Evaluation (TRE) in accordance with Section **F. GENERAL PROVISIONS** 28 of Waste Discharge Requirements Order No. R1-2004-0036. The Permittee may propose an evaluation equivalent to a TRE and implement it if approved by the Regional Water Board Executive Officer. If the two additional samples are in compliance with the acute toxicity requirement, then it will be presumed that the effluent is not acutely toxic. If the discharge has ceased before the additional samples could be collected, the Permittee shall contact the Executive Officer within 21 days of receiving

the sample results with a plan to demonstrate compliance with the acute toxicity effluent limitation.

EFFLUENT CHRONIC TOXICITY MONITORING

1. Critical life stage chronic toxicity tests shall be performed to measure chronic toxicity (TUc) on a quarterly basis, beginning July 1, 2005. A minimum of three test species, from the following list, with approved test protocols shall be used to measure compliance with the toxicity limitation. Other tests may be used, if they have been approved for such testing by the State Water Board. If possible, the test species shall include a fish, an invertebrate, and an aquatic plant. After two quarters or more, and following approval by the Regional Water Board, monitoring can be reduced to the most sensitive species. Dilution and control water should be obtained from an unaffected area of the receiving waters. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay test and reported with test results.

   The following list is for saltwater organisms. The list may be revised before commencing chronic toxicity testing and after discussions between the Permittee and Regional Water Board staff. Revisions may include additional saltwater organisms or freshwater organisms.

Approved Tests – Chronic Toxicity			
Species	Effect	Tier[5]	Reference[6]
Giant kelp, Macrocystis pyrifera	Percent germination; germ tube length	1	a,c
red abalone, Haliotis rufescens	abnormal shell development	1	a, c
oyster, Crassostrea gigas; mussels, Mytilus spp.	abnormal shell development; percent survival	1	a, c

[5] First tier methods are preferred for compliance monitoring. If first tier organisms are not available, the Permittee can use a second tier test method following approval by the Regional Water Board.

[6] Protocol References:
Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. U.S. EPA Report No. EPA/600/R-95/136.
Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1991. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms. U.S. EPA Report No. EPA-600-4-91-003.
SWRCB 1996. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project. 96-1WQ.
Weber, C.I., W.B. Horning, I.I., D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L.Robinson, J. Menkedick and F. Kessler 9eds). 1998. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-87/028. National Information Service, Springfield, VA.

Approved Tests – Chronic Toxicity			
urchin, Strongylocentrotus purpuratus; sand dollar, Dendraster excentricus	percent normal development	1	a, c
urchin, Strongylocentrotus purpuratus; sand dollar, Dendraster excentricus	percent fertilization	1	a, c
shrimp, Homesimysis costata	percent survival; growth	1	a, c
shrimp, Mysidopsis bahia	percent survival; fecundity	2	b, d
topsmelt, Atherinops affinis	percent survival; growth	1	a, c
Silversides, Menidia beryllina	larval growth rate; percent survival	2	b, d

2. The Permittee shall conduct accelerated monitoring in the event of the following conditions:

   a. A three-sample median value is greater than 1.0 TUc, or
   b. A single-sample maximum value is equal to or greater than 2.0 TUc

   Accelerated monitoring shall consist of monitoring at frequency intervals of one half the interval given for routine monitoring. If data from accelerated monitoring tests are found to be in compliance with the evaluation parameters (a and b, above), then routine monitoring shall be resumed. If accelerated monitoring tests continue to exceed either evaluation parameter, then the Permittee shall initiate a TRE in accordance with Section **F. GENERAL PROVISIONS** 28 of the Waste Discharge Requirements. The Permittee may propose an evaluation equivalent to a TRE and implement it, if approved by the Regional Water Board Executive Officer.

3. Reporting of chronic toxicity test results shall be provided in the most recent self-monitoring report and, at a minimum, include for each test:

   a. sample date(s)
   b. test initiation date
   c. test species
   d. end point values for each dilution (e.g., number of young, growth rate, percent survival)
   e. NOEC value(s) in percent effluent
   f. IC15, IC25, IC40, and IC50 values (or EC15, EC25…etc.) in percent effluent
   g. TUc values (100/NOEC, 100/IC25, 100/ EC25)
   h. Mean percent mortality (± s.d.) after 96 hours in 100 percent effluent (if applicable)
   i. NOEC and LOEC values for reference toxicant test(s)
   j. IC50 or EC50 value(s) for reference toxicant test(s)
   k. Available water quality measurements for each test (ex. pH, DO, temperature, conductivity, hardness, salinity, ammonia)

4. Reporting of toxicity monitoring shall also include a summary table of chronic toxicity data from the three most recent, previous analyses.

MONTHLY REPORT

The purpose of the report is to document treatment performance, effluent quality, and compliance with waste discharge requirements prescribed by Order R1-2004-0036. For each calendar month, a self-monitoring report shall be submitted to the Regional Water Board on or before the first day of the second month following the reporting period. For example; a January report is due March 1st. The monthly reports shall be prepared in accordance with the following:

1. Letter of Transmittal. Each Report shall be submitted with a letter of transmittal. This letter shall include the following:

    a. Identification of facility: Name, address, WDID number;
    b. Date of report and monitoring period;
    c. Identification of all violations of effluent limitations or other discharge requirements found during the monitoring period;
    d. Details of the violations: parameters, magnitude, test results, frequency, and dates;
    e. The cause of the violation;
    f. Discussion of corrective actions taken or planned to resolve violations and prevent recurrence, and dates or time schedule of action implementation; and
    g. Authorized signature and certification statement.

2. Compliance Evaluation Summary: Each report shall include a Compliance Evaluation Summary. The summary shall illustrate clearly the facility's compliance with all effluent limitations and other waste discharge and reclamation requirements, as required. During periods of no discharge, the reports shall certify no discharge.

3. Results of Analyses and Observations

    a. Tabulations of all required analyses, including parameter, sample date and time, sample station, and test result;
    b. If the Permittee monitors any pollutant more frequently than required by this Permit, using test procedures approved under 40 CFR Part 136 or as specified in this Permit, the results of this monitoring shall be included in the calculation and report of the data submitted in the discharger monitoring report; and
    c. Calculation of all effluent limitations that require averaging, taking of a median, or other calculation.

4. Report Submittal: Copies of each monitoring report shall be mailed to:

North Coast Regional Water Quality Control Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403
Fax: (707) 523 - 0135

and to:

U.S. EPA, Region 9
Attn: WTR-7, NPDES/DMR
75 Hawthorne Street
San Francisco, California 94105

ANNUAL REPORT

By February 28 of each year, the Permittee shall submit an Annual Report to the Regional Water Board. The report shall contain both tabular and graphical summaries of the monitoring data and disposal and reclamation records from the previous year. In addition, the Permittee shall discuss the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the Permit.

Ordered by _____
Catherine E. Kuhlman
Executive Officer

June 22,2004

ArcataMandR3-29-03(revised)